REMARKS

Claims 1-17 are pending. Applicant appreciates the Examiner's thorough examination of the subject application and requests reconsideration of the subject application based on the following remarks.

1. 35 U.S.C. §112 Rejections

Claims 1-4 and 17 are rejected under 35 U.S.C. §112, second paragraph. The Office asserts that the claims are indefinite because "it is unclear what the S/N ratio of the detection signal is, how it can be 'produced' and how this S/N ratio can be 'satisfied'."

Applicants respectfully submit that the S/N ratio and how to determine the S/N ratio would be clear to one of skill in the art. The S/N ratio of a signal (detection signal) is the power ratio between the signal and the background noise. The S/N signal is not "produced", but, rather, it is the ratio of the two power levels. The S/N ratio is satisfied when the two power levels are such that they provide a predetermined value.

Applicants respectfully submit that the claim language would be clear to one of ordinary skill in the art in view of the specification. Reconsideration and withdrawal of the rejection is respectfully requested.

2. 35 U.S.C. §103 Rejections

Claims 1-3, 10, 13-14, and 16-17 are rejected under 35 U.S.C. §103(a) over Sugimoto et al. (US 5,565,899) and Nagasaki et al. (US 6,036,305).

Claim 1

Applicants claim, in independent claim 1, an image forming apparatus, comprising an ink storage section for storing ink therein; an ink supplying path for supplying, to a print head, the ink stored in the ink storage section; and an electrode for detecting whether the ink is present or absent in the ink supplying path, wherein an amount of the ink supplied into the ink supplying

path per minute is such that a predetermined S/N ratio of a detection signal produced by the electrode is satisfied.

Applicants respectfully traverse.

It is well established that in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143.

The Office acknowledges that Sugimoto does not specify the S/N ratio of the detection signal. In fact, Sugimoto does not at all mention the S/N ratio. Sugimoto clearly does not teach that an amount of the ink supplied into the ink supplying path per minute is such that a predetermined S/N ratio of a detection signal produced by the electrode is satisfied. Further, this is not at all suggested by Sugimoto. Sugimoto is completely silent with respect to any relationship between the flow of ink to the supplying path and an S/N ratio and what, if anything, a specified relationship between these two values would or could accomplish, if anything. There is absolutely no suggestion to modify Sugimoto so as to provide a relationship between ink flow and S/N ratio. Rather, this comes purely from Applicants' disclosure.

Further, Applicants respectfully submit that Sugimoto utilizes a resistance measurement between two electrodes to detect the presence or absence of ink (see col. 32, lines 36-41). It is well known by those of skill in the art that resistance measurement is distinct from determining a S/N ratio. A S/N ratio is calculated as a signal voltage divided by noise voltage. Resistance, on the other hand, is calculated as a signal voltage divided by a signal current. Sugimoto does not teach or suggest that a S/N ratio could or should be used in place of a resistance measurement.

Further, while Sugimoto uses a resistance measurement to detect the presence or absence of ink, Applicants teach a flow rate at which ink is supplied.

With respect to the Office's assertion that adjusting the ink flow for providing a predetermined S/N ratio is considered to be a matter of design expedient, Applicants respectfully disagree. The mere fact that references can be modified does not render the result obvious unless the prior art also suggests the desirability to do so. See *In re Mills,* 916 F2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990); MPEP §2143.01. Further, it is well established that even if a modification may be within the capabilities of one or ordinary skill in the art, that is insufficient to establish a prima facie case of obviousness without suggestion to make the modification. The level of skill in the art cannot be relied upon to provide the suggestion. See *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313 (Fed. Cir. 2000) *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999); MPEP §2143.01. In this case, as acknowledged by the Office, Sugimoto does not at all make mention of the S/N ratio, much less a relationship between the S/N ratio and the ink flow rate. There is absolutely no suggestion provided for making the proposed modification.

Still further, Applicants respectfully submit that if Sugimoto was modified to use a S/N ratio to control the rate at which ink is supplied, this would render Sugimoto unsatisfactory for its intended purpose of detecting the presence or absence of ink using a resistance measurement between two electrodes. When ink is absent, Sugimoto is then able to determine how many sucking actions should be carried out to resume ink flow. By adjusting the ink flow to provide a predetermined S/N ratio, the ink flow is set to a specific value and, as a result, there would never be a situation when ink is absent. Thus, there is no suggestion or motivation to make the proposed modification.

Nagasaki does not remedy the deficiencies of Sugimoto. Nagasaki, like Sugimoto, does not at all mention the S/N ratio.

Accordingly, claim 1 is patentable over Sugimoto and Nagasaki. Claims 2, 3, and 17 depend from claim 1 and, likewise, are patentable over Sugimoto and Nagasaki. Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 10

Applicants claim, in independent claim 10, an image forming apparatus, comprising an ink storage section for storing ink therein; an ink supplying path for supplying, to a print head, the ink stored in the ink storage section; an electrode for detecting whether the ink is present or absent in the ink supplying path; and first and second filters in the ink supplying path, wherein the first filter is located upstream to the second filter, and the second filter has a larger filtration accuracy than the first filter.

Applicants respectfully disagree with the Office's assertion that the second filter (700a) of Sugimoto "must have a larger filtration accuracy than the first filter (700)" because it is "placed down stream from the first filter (700) to further filter out particles passing through the first filter."

Applicants submit that Sugimoto does not teach or suggest that a second filter is provided for further filtering out particles passing through the first filter, as asserted by the Office. Rather, Sugimoto utilizes a filter to prevent ink in the ink passage from retracting back into the ink container due to negative pressure of the absorbing material 900 when sucking action is released. In particular, according to Sugimoto, a second filter 700a is provided in the ink supply passage at the position of contact with the ink absorbing material 900. If the filter 700a is not provided, sucking action sucks ink to the halfway point in the ink supply passage 1600a, but as soon as the sucking action is released, negative pressure of the absorbing material 900 retracts the ink. (See col. 19, lines 21-27) Sugimoto provides a filter 700a in the ink supply passage 1600a such that $V_D > V_1$ (V_1 is a volume between the filter 700 and filter 700a and V_D is the sucking quantity per one sucking action of the sucking pump). As a result, the when the ink is retracted by negative pressure of the absorbing material 900, a meniscus is formed in the mesh of the filter 700a. The meniscus retaining force is stronger than the negative pressure of the absorbing material 900, and

therefore, the ink is retained in the filter 700a, rather than being retracted back into the ink container. (See col. 19, lines 27-39) Thus, the filter is provided for retaining the ink, not for further filtering out particles passing through the first filter.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). Rather, "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)(MPEP §2112)

Applicants respectfully submit that the filter 700a of Sugimoto clearly would not necessarily have a larger filtration accuracy than the first filter given the explicit disclosure of Sugimoto, and, thus, this would not be an inherent feature of Sugimoto.

Accordingly, claim 10 is patentable over Sugimoto. Nagasaki does not remedy the deficiencies of Sugimoto. Thus, claim 10 is patentable over Sugimoto and Nagasaki. Claims 13, 14, and 16 depend from claim 10 and, likewise, are patentable over Sugimoto and Nagasaki. Reconsideration and withdrawal of the objection is respectfully requested.

3. Allowable Subject Matter

Applicants appreciate the notification in the Office Action of allowable subject matter, i.e. that claims 4, 11, 12, and 15 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims, and that claims 5-9 are allowable. Inasmuch as Applicants believe that claims 1 and 10, the base claims of claims 4, 11, 12, and 15, are allowable, claims 4, 11, 12, and 15 have not been amended as requested.

Applicants, however, reserve the right to later amend the subject application so as to present any one or more of these claims in independent form.

CONCLUSION

It is believed the application is in condition for immediate allowance, which action is earnestly solicited. Should the Examiner wish to discuss any of the amendments and/or remarks made herein, the undersigned attorney would appreciate the opportunity to do so.

If for any reason a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge or credit Deposit Account No. 04-1105 under order no. 60710 (70904).

Respectfully submitted,

Date: June 20, 2006

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